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STATE OF CALIFORNIA

EMBARGOED FOR 8:30 a.m. Aug. 14, 2002
NR#2002-35
August 14, 2002

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SIX PRELIMINARY SEISMIC HAZARD ZONE MAPS COVERING ALAMEDA COUNTY ARE RELEASED

Liquefaction, Landslide Potential During Quakes is Highlighted

SACRAMENTO -- Significant portions of Alameda County could be susceptible to landslides or liquefaction in the event of a strong earthquake, according to six new Seismic Hazard Zone maps released today by the California Department of Conservation.

The communities affected include Oakland, Berkeley, Hayward, Alameda, San Leandro, Emeryville and Albany. Three Seismic Hazard Zone maps covering the cities of Oakland and Piedmont were released in 2000; the new maps incorporate new geologic information.

The U.S. Geological Survey also released two new non-regulatory maps that complement the Seismic Hazard Zone maps.

Strong shaking causes most of the damage during an earthquake. However, Seismic Hazard Zone maps, produced by DOC's California Geological Survey, show areas at risk from landslides and liquefaction during an earthquake of magnitude 6.0 or greater. These secondary hazards can be dangerous when poor soil conditions exist within 40 feet of the ground surface.

The 1989 Loma Prieta earthquake caused extensive liquefaction-related damage in San Francisco's Marina District. Liquefaction occurs when water-saturated sandy soil is shaken and, much like quicksand, temporarily cannot support buildings or other heavy structures. Liquefied sand can cause the ground to crack and move, resulting in damage to structures, buried pipelines and utilities. Loma Prieta also caused landslides that blocked two lanes of Highway 17 and damaged residences in the Santa Cruz Mountains.

Once they become official after a six-month review, the maps will impact local planners, developers, property sellers and real estate agents. If property is located in a "zone of required investigation," where liquefaction or landslides could occur, the local

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building department must require geologic studies before projects are issued permits. Also, property sellers and real estate agents must inform potential buyers if property they're selling is in a Seismic Hazard Zone, as is the case when property is in a designated flood or wildfire zone. The maps have had no demonstrable impact on real estate prices.

It is generally not as cost effective to retrofit an existing building for the impacts of liquefaction or landslides as it is to build in safety features at the design stage. Therefore, design changes are required before new developments are approved and constructed. Changes – such as deep foundations in liquefaction zones and slope stabilization in landslide zones -- made during the planning phase can lessen the impact and better protect life and property during future earthquakes. The new maps are important tools that land developers will use to ensure project feasibility.

"Knowing where liquefaction and landslides are most likely to occur means that local officials can require special engineering steps on new construction to make people and buildings safer," Department of Conservation Director Darryl Young said.

Each map covers about 60 square miles. Here's a closer look at what each shows:

? San Leandro quadrangle: The San Francisco Bay occupies about half of the area on this map. However, parts of the cities of Oakland, Alameda, San Leandro and Hayward are shown, as well as some unincorporated portions of Alameda County. Liquefaction zones cover most of the mapped land area, from the Oakland Coliseum south to the Salt Evaporators, and from the east bay coastline east to the MacArthur Freeway (580). The northeastern corner of the quadrangle includes some landslide zones on the East Bay Hills.

? Richmond quadrangle: The Richmond map zones were only done for Alameda County, covering the southern 20 percent of the map. A liquefaction zone covers a small area in Albany from the Golden Gate Fields area east to San Pablo Avenue, from Cedar Street north to about Solano Avenue. Also, a narrow zone follows a creek bed easterly from San Pablo Avenue to Hopkins Street. Broad landslide zones occur in the Grizzly Peak areas of Cragmont, and some areas in the Thousand Oaks areas. Small landslide

areas occur on the slopes of Albany Hill along Interstate 80.

? Oakland East and Oakland West: Liquefaction zones cover all of Alameda and western Oakland from the bay coastline to a few blocks east of Highway 24. About a square mile centered on Lafayette Square is excluded from the zone. Liquefaction zones have been mapped along the Nimitz Freeway across from Alameda, spreading out southeast to the Oakland Coliseum. The zones extend along the beds of Samsal Creek and Peralta Creek. Landslide zones have been mapped in the Oakland and Berkeley hills. The zones extend from the UC Berkeley campus northeast of Ashby Avenue to a two-mile wide region between Skyline Blvd and the MacArthur Freeway southeasterly through Knowland Park to San Leandro.

? Briones Valley: No zones of required investigation for liquefaction were mapped in the Alameda County portion of this quadrangle. However, historically the combination of dissected terrain and weak rocks has produced abundant landslides. A landslide zone covers about 55 percent of the Alameda County land area in the quadrangle.

? Hunters Point: No zones of required investigation for landslides were mapped in the Alameda County portion of this quadrangle. While the Hunters Point Quadrangle covers approximately 60 square miles in Alameda, San Francisco, and San Mateo counties, San Francisco Bay occupies most of the area. An official Seismic Hazard Zone map covers the portions of the City and County of San Francisco in this quadrangle. The Alameda County land shown on the new map consists of approximately half a square mile at the north end of Bay Farm Island, which includes a southern section of the City of Alameda. The liquefaction zone covers the entire land area of Bay Farm Island.

DOC/California Geological Survey geologists use computer models as well as analyses of existing geological mapping and hundreds of engineering borings to produce the maps, which are drawn on a scale where one inch equals 2,000 feet.

Black and white copies of preliminary maps can be purchased from BPS Reprographic Services in San Francisco, (415) 495-8700. Color copies of official

maps can be purchased through DOC's California Geological Survey (415) 904-7707 or (916) 445-5716. The maps also can be viewed and downloaded on the Web at http://gmw.consrv.ca.gov/shmp.

One of the new maps from the USGS shows the liquefaction hazard in the communities of Alameda, Berkeley, Emeryville, Oakland and Piedmont for a magnitude 7.1 earthquake on the Hayward Fault. USGS scientist Thomas Holzer explained that this map complements the new Seismic Hazard Zone maps by showing the degree of liquefaction hazard within the liquefaction zone mapped by DOC's California Geological Survey.

The second USGS map shows the capability of different soil types to amplify earthquake shaking in the communities of Alameda, Berkeley, Emeryville, Oakland, and Piedmont. Records from many earthquakes show that ground conditions immediately beneath a building affect how hard the building shakes. For example, said Holzer, buildings on soft clay soils tend to shake more violently than those on rock. In 1989, after the Loma Prieta earthquake, much of the damage in San Francisco and the east bay was a result of this effect, Holzer said.

The USGS maps are available for viewing at http://quake.wr.usgs.gov (contains link to printable maps); the spatial database and accompanying report are available for downloading at http://geopubs.wr.usgs.gov/open-file/of02-296/ as Open-file Report 02-296, "Liquefaction Hazard and Shaking Amplification Maps of Alameda, Berkeley, Emeryville, Oakland, and Piedmont, California: A Digital Database."

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